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CENTRAL INTELLIGENCE AGENCY

INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

STAT

COUNTRY Soviet Zone Austria

SUBJECT Economic - Industrial

DATE OF INFORMATION 1949

HOW PUBLISHED Daily newspaper

DATE DIST. 24 Jan 1950

WHERE PUBLISHED Zurich

NO. OF PAGES 2

DATE PUBLISHED 16 Nov 1949

LANGUAGE German

SUPPLEMENT TO REPORT NO.

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SOURCE Neue Zuercher Zeitung, No 2362, 1949.

EUROPE'S LARGEST TURNING MACHINE BUILT IN AUSTRIA

A mammoth turning machine, [redacted] the largest in Europe, has recently been completed by the Voith Machine Shops and Foundry of Sankt Poelten, Austria, at a cost of approximately 4 million schillings. STAT

The construction method is new and adapted to the specific shapes and parts of the Kaplan turbines and huge generators. Whereas heretofore the object to be processed was mounted on a turning plate which revolved around stationary cutting tools, in this new machine, the object rests on a fixed base of unlimited load capacity, which also provides safe and ample space for the operating personnel. The cutting tools may revolve either inside the object being worked or over or around it and are thus able to process any concave, frontal, or external surface. For long, narrow drill holes a drill is inserted in the center and attached to the base. To provide the finished pieces with the necessary screw holes, the machine is equipped with a powerful drilling unit as well as with a mechanical spacing device which spaces holes automatically and accurately.

This mammoth machine can turn pieces up to 15 meters in diameter and 5 meters in height. There is no restriction on weight; precision will not be affected whether the piece weighs 5 tons or 500 tons. The drive mechanism is so powerful that a cutting strength of 10,000 kilograms can be achieved. Nevertheless, power consumption is comparatively low because this process obviates the necessity of moving the heavy object in work, together with the rotary plate, on enormous friction bearings. Only the arms with the supports, the load of which is borne by heavy roller bearings, need be moved.

The three-pointed star on which the arms are mounted is made of steel-reinforced concrete and weighs 200 tons. The mounting for the two rotating arms is located in the center of the star. These arms are arranged horizontally and the two turning supports and the drill support are attached to them. The turning arms are driven by a direct current motor with a wide control range and a four-speed gear acting upon a centrally located bevel gear whose vertical shaft drives three spur wheels by means of an automatically controlled pinion. These spur gears, in turn, drive a central spur gear which is fastened to the turning arms by means of

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[redacted]: The number of revolutions of the turning arms can be regulated continuously from one revolution per hour to 7.5 revolutions per minute. The central mechanism of the turning arms contains the gear shift transmissions for the support and feed ram, which are operated electromechanically, by means of push buttons, from platforms on the supports. These gears are set up for eight speeds and provide for feeding at between 0.5 and 10 millimeters. One high-speed motor each takes care of the quick adjustment of supports and rams and is also operated by push buttons from the platforms.

The total weight of parts mounted on the star is 100 tons. The star rests on three worm-gear spindles which have to support the total weight of reinforced concrete and iron, amounting in all to 300 tons. By means of the spindles the loads can be raised or lowered five meters. For this purpose they are driven by a combination electric motor and shaft. Between the motor and the shaft a ten-speed gear has been installed which is connected when central drilling is performed on work pieces and when feed must be effected by rotation of the star.

The three pillars which support the star are 14 meters high, including the base, and are made of reinforced concrete. Each pillar weighs 250,000 kilograms. The base for the rails to which the work piece is fastened is of reinforced concrete 3 meters in depth and weighs 1,300 tons; 2,500 tons of reinforced concrete and 250 tons of iron and steel are used.

These enormously heavy masses of reinforced concrete and iron contain a close network of hundreds of electric lines and extremely sensitive precision equipment, extending from the switchboard via the star to the arms, up to the two platforms, on which a man may ride along and control the performance of the cutting tool. Twenty-three electric motors of 0.5 to 100 horsepower move the various parts at the operator's will. All control devices are operated by push buttons, and the light signals give a comprehensive picture of the position and movement of the various components. Even the platforms, on which the operating personnel may stand or ride, are raised to the desired height like elevators, by pushing a button.

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